CV 2000
E1 Access Unit - G704 Converter
Instruction Manual

P/N : 8000 601 637
Revision 07

Sales, Research & Development, Manufacturing :

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The only purpose of this manual is to provide information and installation instructions

CXR reserves the rights to improve its products and specifications without notice.

CXR has made every effort to provide the best possible quality in writing this manual but cannot be held responsible for any damage, which could result from errors or improper description of the equipment, its characteristics and operation.

Please read and enforce the safety instructions of the safety and installation chapters.

The team at CXR Anderson Jacobson thanks you for choosing the CV2000 Interface Converter

We hope that this equipment will provide full satisfaction and in order to serve you even better, we thank you for returning the warranty card you will find at the end of this manual.

We also invite you to read the last part of this manual, which provides useful information on the warranty terms and conditions, which apply to your equipment.

Content

1. INTRODUCTION 9

1.1. DTE INTERFACE 9
1.2. CONDITIONING 9
1.3. CONFIGURATION 9

2. INSTALLATION 10

2.1. DESKTOP VERSION 10
2.2. RACK MOUNT VERSION 11

3. FRONT PANEL, DISPLAY AND SWITCHES 13

3.1. LED DISPLAY 13
3.2. THE PUSH BUTTON 13

4. TYPICAL APPLICATIONS 14

4.1. LAN TO LAN CONNECTION 14
4.2. LAN TO LAN BRIDGING 14
4.3. TERMINAL ADAPTER TO PBX TRANSPORT 15

5. OPERATION AND CONFIGURATION 15

5.1. FACTORY AND USER CONFIGURATIONS 16
5.2. MXCFG CONFIGURATION SOFTWARE 16
5.3. VT100 INTERACTIVE MENUS 17
5.3.1. Main menu 18
5.3.2. Menu 1: Configuration 18
5.3.3. Menu 1.2 : Edit a configuration 19
5.3.4. Menu 1.2.1: TS Selection menu 21
5.3.5. Menu 2: Status and statistics 22
5.3.6. Menu 3: Loop Test 22
5.3.7. Menu 4: Display and passwords 23
5.3.8. Menu 5 : Remote control 23

6. INTERFACES PARAMETERS 24

6.1. V11/X21 INTERFACE (CV2011) 24
6.1.1. General 24
6.1.2. Parameters 24
6.2. V35 & V36 INTERFACES (CV2035 & CV2036) 25
6.2.1. General 25
6.2.2. Parameters 26
6.3. V24/V28/RS232 INTERFACE (CV2028) 26
6.3.1. General 26
6.3.2. Synchronous mode parameters 27
6.3.3. Asynchronous mode parameters 28
6.4. ETHERNET 10BASET BRIDGE INTERFACE (CV20BT) 29
6.4.1. General 29
6.4.2. Parameters 30

6.5. 4 ISDN S INTERFACE (CV24BR) 30
6.5.1. General 30
6.5.2. Parameters 31
6.5.3. CV24BR Rear Panel 32

7. DIAGNOSTICS AND TESTS 33

7.1. DIAGNOSTICS 33
7.1.1. Timeslot assignment and clock 33
7.1.2. Network Interface Status 34
7.1.3. DTE Interface Status 34
7.1.4. Error Statistics 35
7.1.5. Status Statistics 35
7.2. TEST 35
7.2.1. Local Analogue Loop 35
7.2.2. Remote Digital Loop 35

8. TECHNICAL CHARACTERISTICS 37

8.1. TRANSMISSION MODES 37
8.2. GENERAL CHARACTERISTICS 38

9. TROUBLESHOOTING 38

10. APPENDIX 39

10.1. APPENDIX A – WIRING 39
10.1.1. Serial Control Port - RJ45 39
10.1.2. RJ45 - Line connector 39
10.1.3. BNC - Line connectors 41
10.1.4. 10 Base T Interface connector 41
10.1.5. X21/V11 interfaces - DB25 connector & DB25-DB15 cable 42
10.1.6. V35 Interface - DB25 Connector and DB25-M34 cable 43
10.1.7. V36 interface - DB25 connector & DB25-DB37 cable 44
10.1.8. V28/RS232 interface - DB25 Connector & DB25-DB25 cable 45
10.1.9. 4BRI Interface RJ45 45
10.2. APPENDIX B - JUMPERS CONFIGURATION 46
10.3. APPENDIX C : WARRANTY, GENERAL CONDITIONS 49

Convention, product range and options

Several versions of the unit differ from the following characteristics:

- The type of Terminal interface: X21-V11, V35, V36/RS530, V28/RS232, 4BRI or 10BT
- The type of power supply: 110 / 230 Vac internal or external, 48 Vdc
- The type of packaging: stand alone enclosure or rack mountable card

These different versions are summarised on the following table. The same designations will be used throughout this manual to identify the differences between versions when applicable.

Desktop

Rack mountable card

Versions : / **Features:**	**2011**	**2035**	**2036**	**2028**	**20BT**	**4BRI**
X21/V11 interface	●					
V35 interface		●				
V36 / RS530 interface			●			
V24/V28/RS232 Sync/Async interface				●		
10BT filtering bridge					●	
4 * ISDN S interface						●
Internal 110 / 230 VAC	PIx					PIx
External 110 / 230 VAC	PVx					PVx
Internal 48 Vdc	PCx					PCx
Rack mount for AMS16/AMS4	PRx					
E1 network interface	XxE					XxE
T1 network interface	XxT					

Example: The CV 2011 PIE is a desktop version with internal 110 / 230 Vac power supply that provides an E1 network interface (G703/G704 2048Kbits/s), an X21-V11 DTE interface DTE.

The 4BRI card isn't available in rack system.

Important Information

Conformity Statement EEC

Manufacturer name: CXR

Manufacturer address: rue de l'Ornette - 28410 ABONDANT - France

States that:

Product name: CV 2000

The CE mark attests the conformity of this equipment to the main requirements of the R&TTE 1999/05/CEE Directive of the European community :

For the user's safety, in compliance with the 73/23/EEC European Directive, as per EN.60950 standard

For electromagnetic compatibility, in compliance with the 89/336/EEC European Directive, as per EN.61000-6-1 and EN.61000-6-3 standards.

CXR states that this equipment is manufactured in compliance with the Annex II of the 1999/05/EEC European Directive.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Safety Instructions

The following accesses are referenced as SELV (Safety Low Voltage] in conformity with EN.41003 standards:

- 5 VDC Input of the CV 2000 PVx desktop unit
- 48 VDC Input of the CV2000 PCx desktop unit
- Line: E1 / T1 leased line connection
- Control: V24 - RS232 configuration port
- DTE - V11: V11-X21 interface of the CV 2011 unit
- DTE - V35: V35 interface of the CV 2035 unit
- DTE - V36: V36/RS530 interface of the CV 2036 unit
- DTE - V28: V28/V24/RS232 interface of the CV 2028 unit
- DTE - 4BRI: 4 ISDN S interface of the CV 24BR unit
- DTE - 10BT: Ethernet interface on the CV 20BT unit

Desktop CV 2000 PVx:

The wall mount power supply adapter is the main switching element. Thus this plug must be installed close to the equipment and provided easy access.

To totally disconnect the equipment from the supply source we recommend you disconnect the power cord from the mains wall outlet. In order to comply with the safety regulations, it is imperative to use the accessories (power supply and cables) provided with the equipment. When access to the inside of the modem is necessary, it is imperative to disconnect the power adapter from the mains outlet.

Desktop CV 2000 PIx:

The power cord is the main switching element. Thus the mains outlet must be installed close to the equipment and provided easy access. In order to comply with the safety regulations, it is imperative to use the accessories (power supply and cables) provided with the equipment. When access to the inside of the modem is necessary, it is imperative to disconnect the power cord from the mains outlet. This is a Class 2 product as shows the symbol close to the mains socket; its earth connection is for functional purpose only.

Rack mountable card CV 2000 PRx:

The power switch located on the rear of the chassis is the only switching element, thus it must be fully accessible. The connection to the mains is achieved through the cable equipped with a male-grounded plug. Extract the card from the chassis when maintenance or servicing is required

For safety reasons, any operation on the equipment and particularly opening the desktop enclosure must be carried out by maintenance person qualified by CXR.

The equipment must imperatively be returned to CXR in any case of anomaly, fall, loss of performance, water exposure, power supply damage, …

Environment

The CV 2000 is designed for residential or light industrial use within the following environmental conditions:

- Storage Temperature 0 to 70 °C
- Operating Temperature: 0 to 45 °C
- Hygrometry: 0 to 90% without condensation
- Class: IP40
- Flammability: UL94-V0

Place the equipment in a area well suited for its good operation and its

- Equipment must not be exposed to excessive solar radiation
- Equipment must not be in contact with water. It must not be used near a water reserve or in a wet location.
- Equipment must be installed on a plane and horizontal surface, without vibration.
- Make sure the area is clean, dry and exempt of dust
- Make sure that nothing could obstruct the air vent of the product, and that no small size part (screw, staple, clip, …) could get into it.
- Always disconnect the mains connection before any operation (move, connecting other equipment, …) on the equipment. The mains cord must be taken from the socket; any effort on the cord could induce damages and risk of electrical shock.

Correct Disposal of the Product - Recycling

In compliance with the European rules for separate collection systems and Waste of Electric and Electronic Equipment, this marking shown on this product indicates that it should not be disposed with other household wastes at the end of working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes an d recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer were they purchased this product, or their local government office for details of where and how they can take this item for environmental safe recycling.
Business users should contact their supplier and check the term and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

Use

The CV 2000 is designed to be connected to an E1 G703/G704 or T1 compatible network or to a an E1 G703/G704 or T1/FT1 compatible equipment. It connects to an X21-V11 or V35 or V36/RS530 or V28/RS232 or Ethernet 10 Base T equipment.

- Interface DTE V11, DTE V35 et DTE V36/RS530:
  - Nx64 from 64 KBPS to 2048 KBPS (16 KBPS V11)
- Interface DTE V24/V28/RS232 :
  - Asynchronous: from 300 BDS to 38400 BPS
  - Synchronous: from 64 KBPS to 128 KBPS
- 10BT Ethernet bridge:
  - Ethernet 802.3
  - Frame buffer memory: 256
  - Mac address memory: 10.000
- G703-G704 interface:
  - rate G703: 2048 Kbps +/- 50ppm
  - coding: HDB3
  - framing: 32 Time Slots - G704 compatible
  - receiver sensitivity: -40 dB
- T1/FT1 interface:
  - T1 rate: 1544 Kbps +/- 50ppm
  - coding: B8ZS or AMI
  - framing: 24 Time Slots(DS0s) with F bit - D4/ESF compatible
  - line build outs: DSX-1 and CSU
  - receiver sensitivity: -36 dB
- 4BRI interface:
  - 4 ISDN S interface
  - Network or Terminal interface

1. Introduction

The CV 2000 is an E1 (2048 KBPS) or T1 (1544 KBPS) network access unit (CSU – DSU) which connects to a terminal X21-V11 or V35 or , V36/RS530 or V24/RS232 or Ethernet 10BT or 4BRI interface. It provides the interface between customer equipment and full or fractional E1 or T1 facilities.

1.1. DTE interface

The CV 2000 can be equipped with two types of interface:

- *X21/V11 ,V35, V36/RS530 , V24/V28/RS232 interface*: for synchronous data transmission at speed of up to 2048 KBPS. Clock can be configured as internal, external or slaved. Most interface signals can be forced or activated when the connection is established.
- *10BT interface*: The built-in Ethernet bridge filters the frames in accordance with their destination MAC address. Only frames with non-local MAC addresses are transmitted to the remote unit. The bridge can memorise up to 10.000 local addresses and process 15.000 frames per second.
- *4BRI interface*: to transport 4 ISDN S interfaces.

1.2. Conditioning

The CV 2000 can meet all integration requirements either as a desktop or rack-mount unit with different power-supply configurations

- External power bloc: provides a regulated 5 VDC from the mains 110/230 VAC
- Internal power supply: the modem includes a 110/230 VAC - 5 VDC power converter which connects directly to the mains outlet via the supplied power cord
- Internal 48 VDC converter: the modem includes a 48 VDC power converter, which can be connected to a 48Vdc supply commonly available in telecom centres.
- Rack-mountable card: the 5 VDC required by the modem is supplied by the rack in which the card is inserted. The AMS 4 and AMS 16 chassis can be powered from 110/230 VAC or 48 VDC depending on the type of power module installed with provision for full redundancy

1.3. Configuration

The CV 2000 is configured in several way:

- Via the serial control port set for VT100 emulation at 19200 BPS with data format of 8 bits, parity none. The configuration is menu driven with on line help facilities. Only a few keyboard strokes will be required to set and save the CV 2000 parameters. These menus also initiate analogue and digital test loops and display a status report and a bit error rate statistics.
- Via the serial control port with the MxCfg configuration software (for Windows).
- Alternatively the modem can be configured using an AT command set which provides access to all modem parameters (19200 BPS 8,n,1).
- The CV 2000 PRx card can also be configured by the CFIP controller card of the AMS16 chassis though its local VT100 mode or TCP-IP Telnet and SNMP management protocols.
- Via a Time Slot (64K) or E1 TS0 through the remote CV2000.

2. Installation

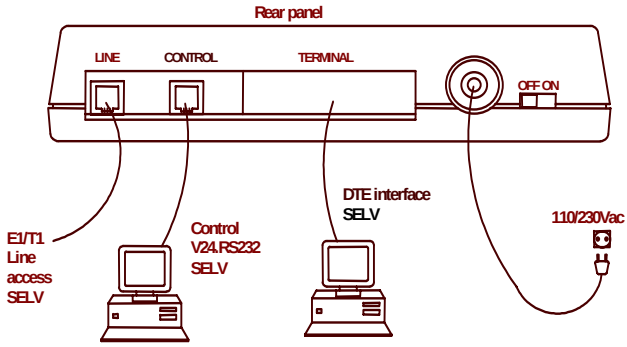
2.1. Desktop version

Accessories

- One RJ45-RJ 45 cable and one RJ45-DB9 converter (P/N: 7055031517) for the control port
- External power supply module when applicable (CV 2000 PVx version)
- CV2011: DB25M-DB15F (X21-V11) cable (P/N:CA601461)
- CV2035: DB25M-V35 (M34F) cable (P/N:CA601460)
- CV2036: DB25M-DB37F cable (P/N:CA601915)
- CV2028: DB25M-DB25F cable (P/N:CA999016)
- This user Manual or the CXR CD-ROM

Connection

- Connect the equipment as per the following drawing. View is from the rear.
- The DTE terminal connector depends on the type of interface:
  - A DB25 socket for X21-V11, V35, V36/RS530, V24/V28 interfaces,
  - An RJ45 socket for 10 Base T
  - 4 RJ45 sockets for 4BRI interface.



(*) 110/230VAC / 5VDC wallmount power supply or 110/230VAC or 48 Vdc cable as applicable.
(*) SELV = Safety low voltage

- For safety reasons it is imperative to use the accessories (power unit and cable) provided with the equipment.

Powering

The mains adapter / cord is the only switching device and therefore the mains outlet should be located close to the equipment and easily accessed

Once the CV2000 PVx has been connected, switch the ON-OFF switch to the « ON » position.

2.2. Rack mount version

Accessories

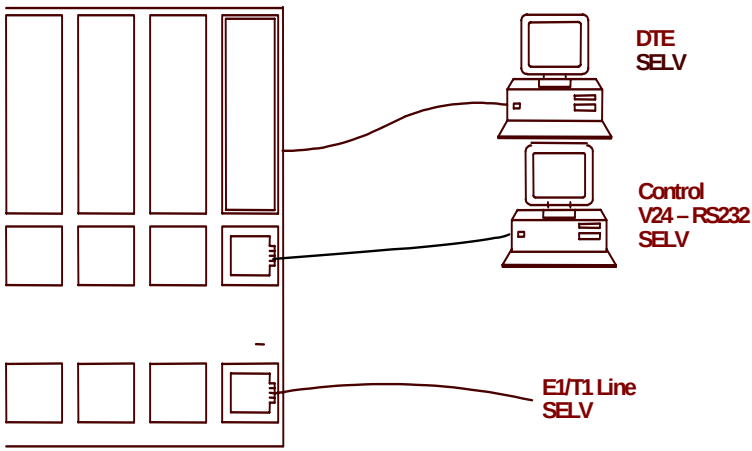
- One RJ45-RJ 45 cable and one RJ45-DB9 converter (P/N: 7055031517) for the control port
- CV2011: DB25M-DB15F (X21-V11) cable (P/N:CA601461)
- CV2035: DB25M-V35 (M34F) cable (P/N:CA601460)
- CV2036: DB25M-DB37F cable (P/N:CA601915)
- CV2035: DB25M-DB25F cable (P/N:CA999016)
- This user Manual or the CXR CD-ROM

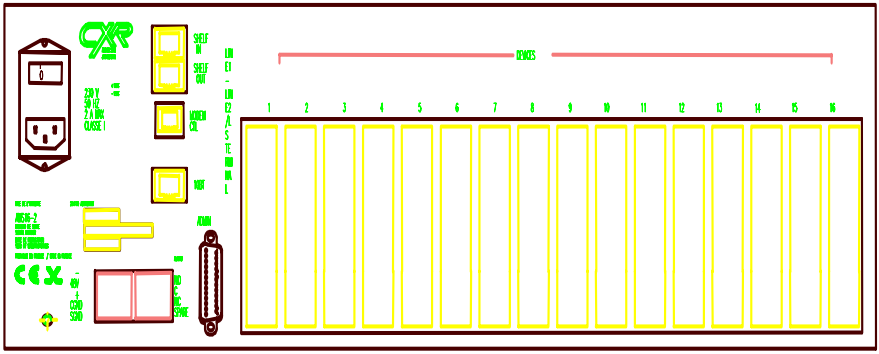
Installation

- Please also refer to the chassis user manual for the modem installation.
- Locate a free slot in the chassis and insert the CV 2000 card.

Connection

- Connect the CV 2000 at the rear of the chassis as per the following drawing.
- The DTE terminal connector depends on the type of interface:
    - A DB25 socket V11/X21, V35 , V36/RS530 and V24/V28 interfaces,
    - An RJ45 socket for the Ethernet 10BT interface.
    - For RJ45 socket for the 4BRI interface.



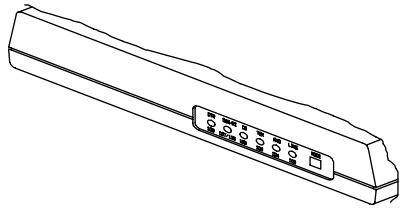


Powering

- The modem card connects to the chassis power supply when it is fully inserted. The chassis is powered on and off through the rear panel mains switch.
- Screw the unit front panel on the chassis to avoid any accidental power or connection loss

3. Front Panel, Display and Switches

This chapter describes the operation of the 6 LED indicators and the push button.



3.1. LED display

Six LED indicators and one pushbutton are installed on the front panel of the Desktop and rack mount unit. The LEDs display an indication on the status of the CV 2000.

LED	Function
☸ / POWER	ON when the unit is powered BLINKING when the unit is powered and the control and configuration terminal is connected and provides an active DTR-108 signal to the control port
DTE	Shows that the terminal equipment is connected : ➢ CV2011 : C (Command) signal state. ➢ CV2035 : RTS state. ➢ CV2036/2028 : DTR state. ➢ CV20BT: LINK state. ➢ CV4BRI: 4 Link states. State of the 4 S0 interfaces activation. Channel 1,2,3,4. Led always green if the 4 interfaces are activated.
SYNC	ON when the E1/T1 G704 link is synchronised BLINKING is case of loss of synchronisation. OFF is case of loss of E1/T1 carrier
ERR	ON (red) in case of CRC error or HDB3/B8ZS/AMI code violation This LED is cleared by the push button (CLR)
DATA	Flashing when data are sent or received on the DTE interface.
TEST	ON (yellow) when the CV2000 is in test mode.

3.2. The push button

The CLR push button is used to clear the ERR LED. The ERR LED can also be cleared in the Menu 2 (VT100 Terminal Mode).

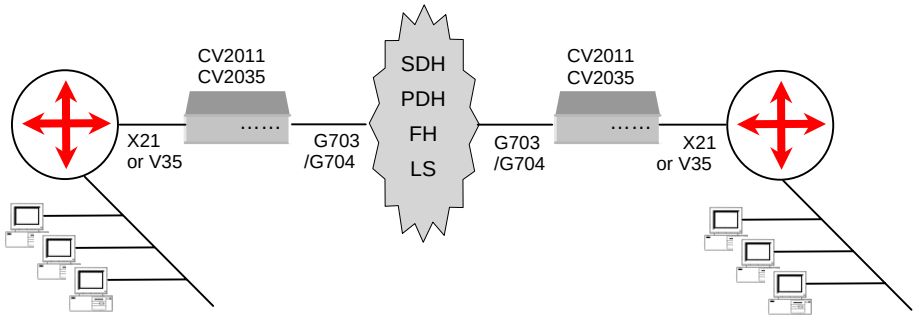
When pushed at power up, it forces the CV2000 to enter in firmware download mode (Flash loader). The Power, DTE and TEST LED stay ON in this state.

4. Typical applications

This chapter describes the basic configuration of the CV 2000 in some typical applications

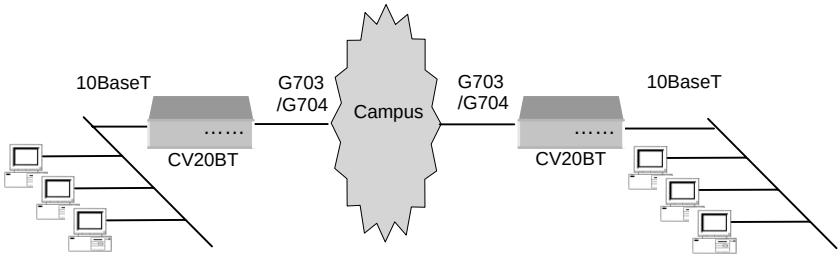
4.1. LAN to LAN connection

Two corporate LAN are connected at high rates through a PDH loop, or a radio link or with a router to an ISP point of presence. The payload may be lower than 2048 KBPS (E1) or 1544 (T1) and provide chipper network access cost (fractional E1 / fractional T1).



4.2. LAN to LAN bridging

Two CV 20BT provide an efficient bridging of two Ethernet networks and spare the use of routers of the previous connection scheme.



In case of problem or if the Ethernet frames do not comply with the IEEE 802.3 standard then the following AT parameters could be set on both CV2000:

*F0: disables the MAC address filtering

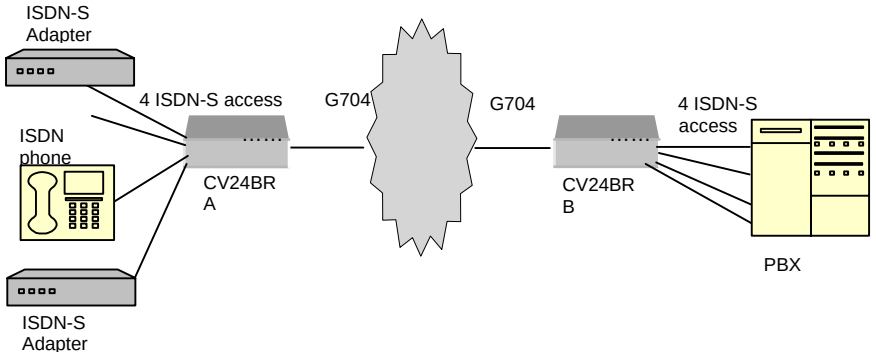
*P0: disables the Padding bit deletion

These parameters are 6 & 7 in the menu 1.2 in VT100 mode.

4.3. Terminal Adapter to PBX transport

A pair of CV 24BR can transport up to 4 ISDN Basic Accesses. For example four Terminal Adapters are connected to a remote PBX , through two CV 24BR over a G704 link.

The four B1+B2+D channels are transported in 12 Time Slots or 9 Times Slots if all D channels are in the same Time Slot.



Timing Consideration

- If PBX is connected to the public telephone network and gives the master source timing. The CV24VBR “B” uses this clock and must be in DTE clock mode, then it sends its clock to the private E1 Network G704, and the CV24BR “A” must be in Network clock mode.
- If PBX is private, the E1 G704 network is the master timing source and gives the clock to the CV24BR, phone, adapters, and PABX. Both CV24BR must be in Network clock mode.

5. Operation and Configuration

This chapter describes the CV 2000 operation through its Control port.

The CV 2000 must be connected to a VT100 compatible terminal or to a PC running a VT100 terminal emulation software that should be configured as follows:

- Speed: 19200 bps
- Data format: 8 bits
- Parity: none
- Stop bit: 1
- Emulation: VT100
- Flow control: none

The CV2000 configuration can be made either in AT command mode or VT100 Interactive menu mode. The choice of mode is automatic: the AT command mode is activated when an “AT” or ”at” character string is received from the control port. The VT100 menu mode is started when the modem detects three consecutive carriage returns or “ENTER” characters.
The use of the VT100 mode offers valuable advantages such as simplicity and on line help.

The use of the AT commands allows writing configuration programs which can be saved out of the unit on a PC for instance and can also be protected with a password.

All the CV 2000 operation parameters can be modified and saved in either mode.

All AT commands are described in "FO8000, CV2000, MX2000 AT Commands" (P/N : 8000 601 836)

5.1. Factory and User Configurations

The CV 2000 has 4 user definable configurations and one read-only factory configuration.

The configuration process consists in setting up the CV 2000 parameters for the application and then saving these parameters in the user memory. The active configuration must then be defined; it is activated even after a power shut-off.

The CV 2000 includes three different memories:

- **The Flash EPROM**, which permanently stores the factory configuration and the firmware
- **The RAM,** where the current configuration is
- **The EEPROM** is a non-volatile memory where the 4 user configurations are saved. The content of this memory is protected even when the unit is switched off.

At the first power-up or after a complete re-initialisation, the content of the three memories is the same and is the factory default configuration.

5.2. MxCfg configuration software

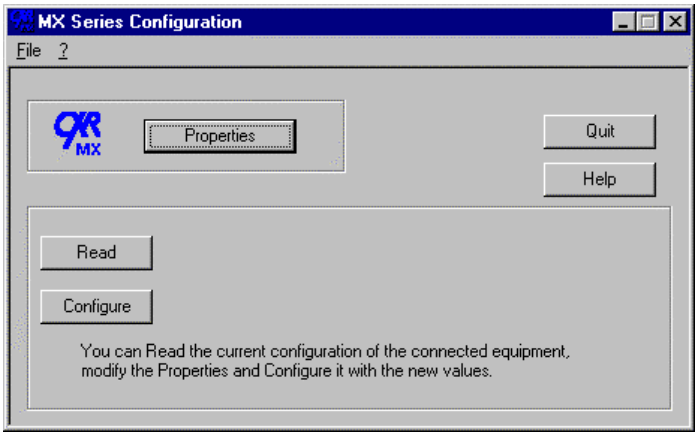
The CV2000 configuration software "MxCfg" (and also for all the CXR TDM equipment) allows you to:

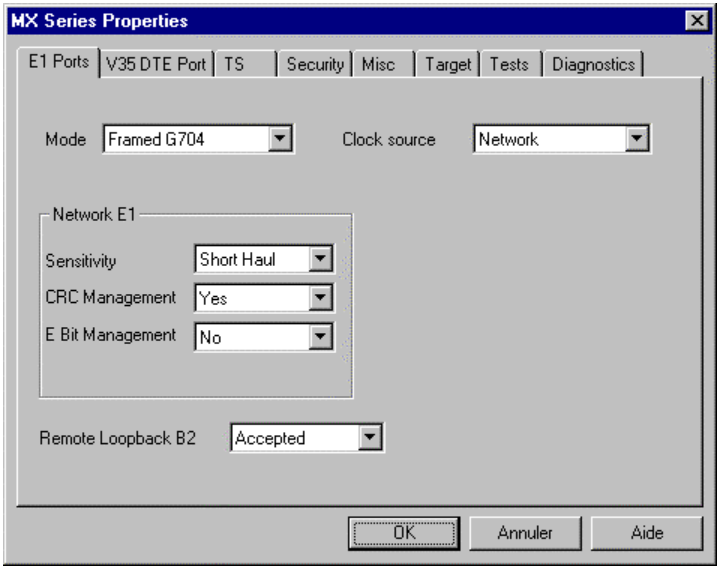
- Display the current CV2000 configuration
- Modify parameters
- Save the new parameters in he equipment
- Save the configuration in file
- Display diagnostics

MxCfg runs under Windows 95/98/Me, Windows NT/2000 , Windows XP.

To install MxCfg run "\tools\french\mxcfg\setup.exe" from the supplied CDROM or "A:\setup.exe" from the floppy disk.

All the software documentation is included in the associated help files: use the "Help" button or the F1 key from all the screens.





5.3. VT100 Interactive Menus

The CV 2000 sends the VT100 menu pages when it detects three consecutive <CR> or 'ENTER' characters.

The possible choices are listed on the bottom line of the screen:

- 1 to 9 are valid options on the menu to start a sub-menu or to change a parameter value
- P or p: to return to the Previous menu
- Q or q: to Quit the VT100 menus and return to the AT command mode

Acknowledge your choice by Enter (or CR)

Some parameters should be selected in a revolving list which can be exited by the '#Abort operation#' choice in any need of aborting the current selection.

The arrow keys must be used in some menus. Some VT100 terminal emulation software may need some settings to allow the use of these keys (HyperTerminal,). The / * - + key may also be used in case of problem.

LEFT:	/	RIGHT:	*	UP:	-	DOWN:	+

5.3.1. Main menu

```
                                CXR - CV 2011 E
                                   Main menu
                               Configuration "usr0*"
                          DTE=16TS, RC=TS31, CRC=OFF, CLK=INT

             1) Configuration
             2) Status and statistics
             3) Loop test
             4) Display and passwords
             5) Remote
-------------------------------------------------------------------------------
             Type your choice: 1 .. 5, Q(uit) and press RETURN
-------------------------------------------------------------------------------
                         CV2000E V1.20 - Dec  2 2002 - 01573893
                               SN: 0208999999001 - 0402
```

The main menu provides access to the configuration(1), status and statistics displays(2), loop test (3) and display & passwords(4) sub-menus. The fifth choice allows to access to the same menus on the remote CV2000 .
Press 'Q' to exit the VT100 menus and return to the AT command mode.

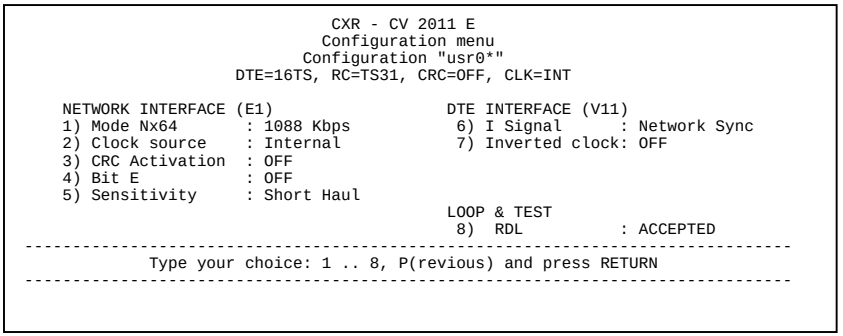
5.3.2. Menu 1: Configuration

```
                                CXR - CV 2011 E
                              Configuration menu
                             Configuration "usr0*"
                        DTE=16TS, RC=TS31, CRC=OFF, CLK=INT

          1) View a configuration
          2) Edit a configuration
          3) Activate a configuration
          4) Remove a user configuration

-------------------------------------------------------------------------------
             Type your choice: 1 .. 4, P(revious) and press RETURN
-------------------------------------------------------------------------------
```

1. **View a configuration**: the arrows select the configuration to view, either the current configuration (Active), or the factory configuration (Factory), or one of the user defined configuration ([user n]).
2. **Edit a configuration**: the arrows select the model of configuration to use. Parameters are edited in a memory dedicated to editing: this memory could be then saved into a user memory, eventually the model one.
3. **Activate a configuration**: the arrows select the configuration that will be active when the unit will restart. It could be the factory or any user defined configuration. Warning: this option restarts the CV2000. The active configuration is spotted by an asterisk '*'. This operation must be confirm or aborted by a choice Yes / No.
4. **Remove a user configuration**: This option is displayed only if user defined configurations are stored in memory. The arrows select the configuration to be removed. The factory configuration becomes the active configuration at the next restart of the unit if the active configuration is removed. This operation must be confirm or aborted by a choice Yes / No.

5. **Save configuration**: this option is displayed after a configuration has been edited. The arrows select the user-defined memory where the edited configuration will be stored. This may overwrite an existing configuration, or define an empty configuration. In this case a name can be given to the configuration. This operation must be confirm or aborted by a choice Yes / No. Warning: the configuration does not become active when it is saved – see the previous option (3)

5.3.3. Menu 1.2 : Edit a configuration


CXR - CV 2011 E
Configuration menu
Configuration "usr0*"
DTE=16TS, RC=TS31, CRC=OFF, CLK=INT
NETWORK INTERFACE (E1)
1) Mode Nx64 : 1088 Kbps
2) Clock source : Internal
3) CRC Activation : OFF
4) Bit E : OFF
5) Sensitivity : Short Haul
DTE INTERFACE (V11)
6) I Signal : Network Sync
7) Inverted clock: OFF
LOOP & TEST
8) RDL : ACCEPTED
Type your choice: 1 .. 8, P(revious) and press RETURN

The parameter is selected by its number then strike the enter key. The edited parameter passes in inverse video mode, and the parameter values change with the arrows. The enter key validates the choice.

Mode Nx64:

Time Slot assignment / Unframed mode: 1) allows to choice unframed mode (E1 G703/2048Kbps or T1 1544Kbps) or to allocate TS (E1 G704 mode or FT1 mode): roll up to 'nnn Kbps' (nnn from 0 to 1984) and type 'Enter' to display the TS allocation menu. When unframed mode is selected the network interface is directly connected to the DTE interface at full rate (E1 2048 Kbps or T1 1544 Kbps). Another G703/E1 mode is also available when you select "2048Kbps"; in this mode data from the DTE are synchronised to the clock edge. The parameters 3 and 4 are ignored in transparent modes.

Clock source :

2) allows to select the clock synchronisation mode between the network and the interface:

- Internal: the transmission to the network is synchronised by the internal clock (based on a crystal oscillator)..
- Network: the transmission to the network is synchronised by the clock recovered from the network receive path. (default value).
- DTE: the transmission to the network is synchronised by the clock provided by the terminal equipment (V11/X21,V35,V36 and V28 Sync. interfaces only).

RDL :

- This parameter enables or disables answer to RDL (remote digital loop) request sent by the remote CV 2000

E1 Network parameters (G703/G704 CV2000 E):

- CRC activation: This parameter defines the G704 CRC4 (E1) mode management . The CRC4 is an option in the G704 frame; the parameter must be at the same value on both sides of the link.
- Bit E: This parameter defines the G704 E bit activation on CRC error detection.
- Sensitivity: This parameter defines the network interface receiver sensitivity. It allows to select low sensitivity on short haul (-12dB for E1) or an high sensitivity on (long haul (-43dB for E1). Generally when the line length is below 300m short haul is used, beyond use 'long haul' (-43dB).

T1 Network parameters (CV2000 T):

- Frame mode: This parameter defines the Muti-frame mode: D4/SF for Superframe mode, ESF for Extended Superframe or Auto to allow the equipment to detect the multi-frame mode.
- SLC: this parameter is only present in D4/SF frame mode. It enables SLC-96 operations.
- FDL msg type: this parameter is only present in ESF frame mode. It allows to set the format of the FDL (Facility Data Link) messages: ANSI T1 or AT&T. Auto allows an automatic format detection.
- Sensitivity: This parameter defines the network interface receiver sensitivity. It allows to select low sensitivity on short haul (-30dB for T1) or an high sensitivity on long haul (-36 dB for T1). Generally when the line length is below 300m short haul is used, beyond use 'long haul' (-36dB).

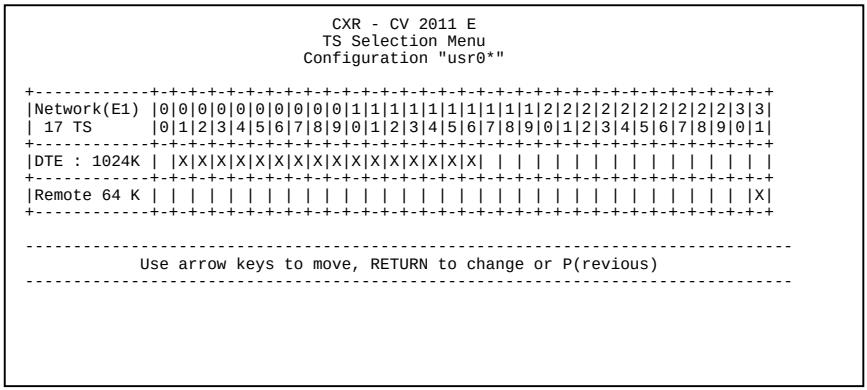
Line code: This parameter defines the code used on the line B8ZS or AMI. Auto enables the equipment to detect the received code.

Line Build Out: This parameter defines the shape of the transmitted signal. Modify it in accordance with our network provider.

TS Rate: This parameter defines the rate of each TS (DS0) 64Kbit/s or 56 Kbit/s

To refer to chapter 6 for the details of specific DTE interface parameters.

5.3.4. Menu 1.2.1: TS Selection menu

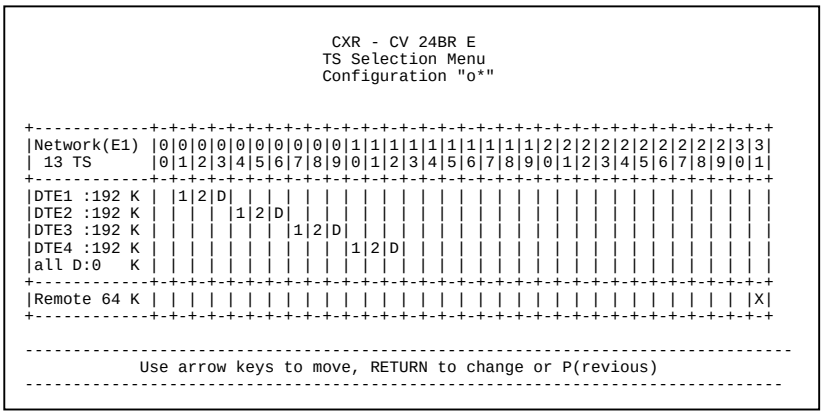


Use Right & Left arrows (or /*) or Up & Down arrows (or -+) to move through Time Slots (TS) allocation table.

The columns of the table represents the time Slots (00 to 31 for E1 and 01 to 24 for T1).
The lines of the table represents the user channels : DTE port V11/35/36/28 or 10 Base T ant the remote control channel.
Use 'Enter' to allocate a network TS to a user channel.

Only one TS can be allocated on the Remote Control line. When there is no TS allocated the TS0 (bit SA4) for E1 network is use (rate 4 Kbit/s) ,

With the 4BRI interface, we see the four DTE , and we choose B1, B2, D channels into Time Slot. It's possible to choose 1 Time Slot for all the 4 D channels.



5.3.5. Menu 2: Status and statistics

```
                    CXR - CV 2011 E : Status & Statistics
          Configuration "usr0*" : DTE=16TS, RC=TS31, CRC=OFF, CLK=INT
+-------------------------+-------------------------+-----------------------+
| E1 network: Carrier=DOWN | Uptime     0 d 02:27:11 |  DTE V11 :    C=DOWN  |
+-------------------------+-------------------+-----+-----------------------+
| RECEIVE                           TRANSMIT    ||                           |
|  Sync FAS=DOWN                     Clock=UP   ||  C(ommand)   =DOWN         |
|  MF CRC=UP                                    ||  I(ndication)=DOWN (=E1)   |
|  Remote Alarm=NONE                            ||                           |
+-----------------------------------------------++---------------------------+
| NUMBER OF ERRORS    Last 24hrs  Prev. hour Cur. hour  Prev 15mn  Cur. 15mn |
| Codage                   422           0          0          0          0 |
| CRC                        0           0          0          0          0 |
| E bit                      0           0          0          0          0 |
| FAS                        0           0          0          0          0 |
| STATUS DOWN                                                               |
| Carrier E1           02:00:00       60:00      27:11      15:00      12:11 |
| Synchro E1           00:00:00       00:00      00:00      00:00      00:00 |
| DTE C                02:00:00       60:00      27:11      15:00      12:11 |
+---------------------------------------------------------------------------+
1) Change errors display mode      2) Change display of status statistics
3) Reset errors led                4) Reset statistics  5) Alarms
            Type your choice: 1 .. 5, P(revious) and press RETURN
```

This menu shows the status of the E1/T1 connection (carrier detection, G704 synchronisation, CRC,) and of the DTE interface (input signals). The error statistics can display either the number of errors or the cumulated time with error. The interface status can display the cumulated time of either up or down status.

Chapter 7 describes these statistics in more details.

Possible choices on this screen are:

- 1 & 2 to change display modes (see chapter 7)
- 3 : to switch off the red LED "ERR"
- 4 : this action reset error counters. To reset all statistics (including the up time) you must type the AT command AT&Z2.
- 5 : to go to the alarm display menu: the rolling list of the 18 last alarms is displayed.

5.3.6. Menu 3: Loop Test

```
                              CXR - CV 2011 E
                              Test & loop menu
                            Configuration "usr0*"
                         DTE=10TS, CRC=OFF, CLK=NWK

       1) Start local loopback
       2) Start remote loopback
       3) Start local digital loopback

-------------------------------------------------------------------------------
          Type your choice: 1 .. 3, P(revious) and press RETURN
-------------------------------------------------------------------------------
```

This menu allows loop test activation:

- Local analogue loop
- Remote digital loop: request a loop to the remote CV2000. The RDL parameter must be set to ACCEPTED on the remote CV2000 in order to accept the loop request and a Remote control channel must be up (via TS0 Sa4 or user TS).
- Local digital loop

5.3.7. Menu 4: Display and passwords

```
                              CXR - CV 2011 E
                            Display and passwords
                            Configuration "usr0*"
                      DTE=16TS, RC=TS31, CRC=OFF, CLK=INT
          1)  Language : English
          2)  Graphic char set : disabled
          3)  Led Mode      : On TD&RD
          4)  Auto-logout time limit : 15
          5)  Site Name :
          6)  Maintenance password
          7)  System manager password

 -------------------------------------------------------------------------------
          Type your choice: 1 .. 7, P(revious) and press RETURN
 -------------------------------------------------------------------------------
```

This menu allows to change user interface parameters:

- the language of the menus: English or French.
- the use of the graphic character set allowed by some VT100 emulators.
- the front panel Data LED mode: you can choice if the front panel LED display the state of transmitted data (TD) received data (RD) or both (TD & RD) on DTE port.
- the inactivity time out (in minutes): after this time without action on the control port the user is logged out.
- The site name: this an equipment identification string (20 characters max.). This name is displayed in the title of all the screens. To erase this string type a space and enter.
- the passwords: the system manager level permits all functions and the maintenance level allows only to view configurations and status & statistics. To erase a password type a space and enter.

5.3.8. Menu 5 : Remote control

This command allows to open and close a session on the remote CV2000. In order to works a remote control channel must be available through:

- TS0 (bit SA4) for E1 network (rate 4 Kbit/s) (default configuration)
- User TS (1 to 31) for E1 network (rate 64 Kbit/s)
- User TS (1 to 24) for T1 network (rate 64 Kbit/s or 56 Kbit/s)

Remote control mode is not supported in Unframed mode (E1/G703 2048Kbit/s or T1 1544 Kbit/s).

A new session on the remote equipment display :

```
CXR - CV 2035 E (REMOTE)
[Enter][Enter][Enter] to start VT100 mode

OK
```

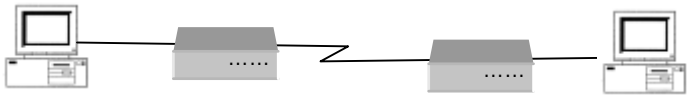
The (REMOTE) term is displayed in all the screens to remember than the remote device is under control. A 2 minutes inactivity counter stops automatically this mode. To go back on the local equipment use the choice 5 on the main menu.

6. Interfaces parameters

6.1. V11/X21 Interface (CV2011)

6.1.1. General

The V11/X21 interface provides interconnection of synchronous data transmission equipment at speed from 64Kbps up to 2048 Kbps (E1) or 1544 Kbps (T1). (16 KBPS in E1 Release 1.40)



Clock Configuration :

Typical Configuration	CV2011 A clock	CV2011 B clock
Clock provided by the CV 2011	Internal	Network
Clock supplied by a DTE	DTE External	Network

The XCK external clock is used for transmit data path. Received data must be synchronised from the received clock (RCK) provided by the CV 2011 if co-directional mode is ON (default), if co-directional is OFF then RCK=XCK.

The signal I (indication) for the X21/V11 interface is configurable.

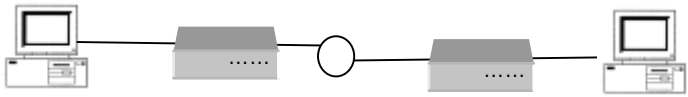
The DTE LED is ON if the C signal from the V11/X21 interface is active; it is OFF in the opposite case.

6.1.2. Parameters

```
                              CXR - CV 2011 E
                            Configuration menu
                          Configuration "usr0*"
                    DTE=16TS, RC=TS31, CRC=OFF, CLK=INT

    NETWORK INTERFACE (E1)                  DTE INTERFACE (V11)
    1) Mode Nx64       : 1088 Kbps           6) I Signal      : Network Sync
    2) Clock source    : Internal            7) Inverted clock: OFF
    3) CRC Activation  : OFF                 8) Codirectional: ON
    4) Bit E           : OFF
    5) Sensitivity     : Short Haul
                                            LOOP & TEST
                                             8)  RDL          : ACCEPTED

--------------------------------------------------------------------------------
            Type your choice: 1 .. 8, P(revious) and press RETURN
--------------------------------------------------------------------------------
```

- I Signal: This parameter controls activation of the X21 'Indication' signal. It can be always active (Forced), reflect the local C(Command) signal status (follow C) or reflect the synchronisation state of the network (Network Sync).
- Inverted clock: the CV2011 adjusts automatically to the received data from the DTE interface (falling or rising edge of the clock). By default transmitted data changes on the falling edge of the clock. If the terminal works on the opposite edge set this parameter to ON.
- Codirectional: By default when clock mode is external (DTE), the CV2011 is co-directional (ON) and the data must be used with the RCK clock. However, if the co-directional mode is OFF then RCK=XCK and data are synchronous with these clocks. This parameter must be used if the equipment connected to the CV2011 does not use RCK when it generates XCK. This parameter is available from release 1.32.
- 16 KBPS : It's possible to change the rate of the V11 at 16 KBPS with the AT command AT@R0=1 on the first screen. Next memorise and activate the new configuration with an AT&WZ. Now, the V11 rate is 16 KBPS. To return to the n*64 KPS with the AT command AT@R0=0 and AT&WZ. New parameter from release 1.44.

16 KBPS is a special functionality, in fact the DTE A is in DTE1 clock and DTE B is in Network clock, but both CV2000 A and B are synchronized with PBX. The number of TS is 4 minimum to transmit the data in transparent mode by "over sample". The DTE A clock and PBX clock can be independent, not clocking by the same reference clock.

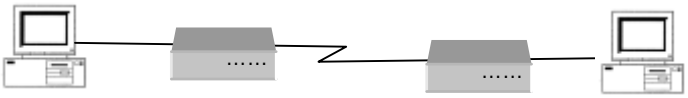


DTE A — CV2011 A (DTE clock) — PBX — CV2011 B (Network Clock) — DTE B

6.2. V35 & V36 Interfaces (CV2035 & CV2036)

6.2.1. General

The V35 and V36 interfaces provide interconnection of synchronous data transmission equipment at speed from 64Kbps up to 2048 Kbps (E1) or 1544 Kbps (T1).



DTE A — CV2035 A — CV2035 B — DTE B

Clock Configuration :

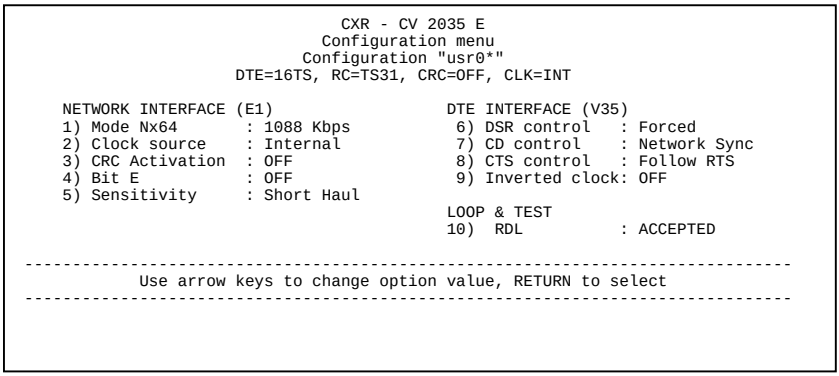
Typical Configuration	CV2035 A clock	CV2035 B clock
Clock provided by the CV 2035 or CV2036	Internal	Network
Clock supplied by a DTE	DTE External	Network

The XCK external clock also called Terminal Timing is used for transmit data path. Received data must be synchronised from the received clock (RCK) provided by the CV 2035.

The following signals of the interface are configurable: DSR, CD ,CTS. They are sometimes called for V36/RS449 interface : DM (data mode) for DSR, RR (receiver ready) for CD, CS for CTS.

The DTE LED is ON if the RTS signal from the V35 terminal is active or if the DTR signal from the V36/RS530 terminal is active; it is OFF in the opposite case.

6.2.2. Parameters


CXR - CV 2035 E
Configuration menu
Configuration "usr0*"
DTE=16TS, RC=TS31, CRC=OFF, CLK=INT
NETWORK INTERFACE (E1)
1) Mode Nx64 : 1088 Kbps
2) Clock source : Internal
3) CRC Activation : OFF
4) Bit E : OFF
5) Sensitivity : Short Haul
DTE INTERFACE (V35)
6) DSR control : Forced
7) CD control : Network Sync
8) CTS control : Follow RTS
9) Inverted clock: OFF
LOOP & TEST
10) RDL : ACCEPTED
Use arrow keys to change option value, RETURN to select

- DSR control: This parameter controls activation DSR - 107 signal of the V35/V36 interface. It can be always active (Forced), follow the local DTR - 108 of the V35/V36 interface (follow DTR) or reflect the synchronisation state of the network (Network Sync).
- CD control: This parameter controls activation CD - 109 signal of the V35/V36 interface. It can be always active (Forced) or reflect the synchronisation state of the network (Network Sync).
- CTS control: This parameter controls activation CTS - 106 signal of the V35/V36 interface. It can be always active (Forced), follow the local RTS - 105 of the V35/V36 interface (follow RTS) or reflect the synchronisation state of the network (Network Sync).
- Inverted clock: the CV2035 adjusts automatically to the received data from the DTE interface (falling or rising edge of the clock). By default transmitted data changes on the falling edge of the clock. If the terminal works on the opposite edge set this parameter to ON.

6.3. V24/V28/RS232 Interface (CV2028)

6.3.1. General

The V24/V28/RS232 interface can work in synchronous or asynchronous mode.

The synchronous mode provides interconnection of synchronous data transmission equipment at speed of 64Kbps and 128Kbps (E1 & T1) or 56Kbps and 112Kbps (T1).

The asynchronous mode provides interconnection of asynchronous data transmission equipment at speed from 300BPS to 38400BPS. This mode use one TS at 64Kbps.

The following signals of the interface are configurable: DSR, CD ,CTS.

The DTE LED is ON if the DTR signal from the V24/RS232 terminal is active; it is OFF in the opposite case.

6.3.2. Synchronous mode parameters

```
                              CXR - CV 2028 E
                            Configuration menu
                          Configuration "usr0*"
                       DTE=2TS, CRC=OFF, CLK=INT

    NETWORK INTERFACE (E1)                  DTE INTERFACE (V28)
    1) Mode Nx64       : 128 Kbps            6) DSR control   : Forced
    2) Clock source    : Internal            7) CD control    : Network Sync
    3) CRC Activation  : OFF                 8) CTS control   : Follow RTS
    4) Bit E           : OFF                 9) V24 mode      : Sync.
    5) Sensitivity     : Short Haul         10) Inverted clock: OFF

                                            LOOP & TEST
                                            11)  RDL          : ACCEPTED
-------------------------------------------------------------------------------
           Type your choice: 1 .. 11, P(revious) and press RETURN
-------------------------------------------------------------------------------
```

- Mode Nx64: this parameter allows the TS allocation: only one or two TS can be allocated in the V24/V28 mode (64 or 128 KBPS). The Unframed mode (2048 KBPS or 1544 KBPS) is forbidden.
- DSR control: This parameter controls activation DSR - 107 signal of the V24 interface. It can be always active (Forced), follow the local DTR - 108 of the V24 interface (follow DTR) or reflect the synchronisation state of the network (Network Sync).
- CD control: This parameter controls activation CD - 109 signal of the V24 interface. It can be always active (Forced) or reflect the synchronisation state of the network (Network Sync).
- CTS control: This parameter controls activation CTS - 106 signal of the V24 interface. It can be always active (Forced), follow the local RTS - 105 of the V24 interface (follow RTS) or reflect the synchronisation state of the network (Network Sync).
- V24 mode: synchronous mode.
- Inverted clock: the CV2028 adjusts automatically to the received data from the DTE interface (falling or rising edge of the clock). By default transmitted data changes on the falling edge of the clock. If the terminal works on the opposite edge set this parameter to ON.

6.3.3. Asynchronous mode parameters

```
                              CXR - CV 2028 E
                            Configuration menu
                          Configuration "usr0*"
                       DTE=1TS, CRC=OFF, CLK=INT

    NETWORK INTERFACE (E1)                  DTE INTERFACE (V28)
    1) Mode Nx64       : 64 Kbps             6) DSR control   : Forced
    2) Clock source    : Internal            7) CD control    : Network Sync
    3) CRC Activation  : OFF                 8) CTS control   : = remote RTS
    4) Bit E           : OFF                 9) V24 mode      : Async.
    5) Sensitivity     : Short Haul         10) Async. rate   : 19200 bit/s
                                            11) Bits number   : 10 bits

                                            LOOP & TEST
                                            12)  RDL          : ACCEPTED

--------------------------------------------------------------------------------
           Type your choice: 1 .. 12, P(revious) and press RETURN
--------------------------------------------------------------------------------
ration
```

- Mode Nx64: this parameter allows the TS allocation: only one TS can be allocated in the V24/V28 asynchronous mode (64KBPS are used independently of asynchronous characters rate). The Unframed mode (2048 KBPS or 1544 KBPS) is forbidden.
- DSR control: This parameter controls activation DSR - 107 signal of the V24 interface. It can be always active (Forced), follow the local DTR - 108 of the V24 interface (follow DTR), follow the remote DTR - 108 (= remote DTR) or reflect the synchronisation state of the network (Network Sync).
- CD control: This parameter controls activation CD - 109 signal of the V24 interface. It can be always active (Forced) or reflect the synchronisation state of the network (Network Sync).
- CTS control: This parameter controls activation CTS - 106 signal of the V24 interface. It can be always active (Forced), follow the local RTS - 105 of the V24 interface (follow RTS), follow the remote RTS (= remote RTS) or reflect the synchronisation state of the network (Network Sync).
- V24 mode: asynchronous mode.
- Async. rate: his parameter allows to set character rate used by the connected V24/RS232 terminal. The maximum value is 38400 bps.
- Bits number: this parameter set the character format used by the V24/RS232 terminal. This is the total number of bits per character including Start bit, data bits, the possible parity bit, et the stop bits: 8,n,1 (8 bits, parity none, 1 stop) match to 10 bits, 7,e,2 (7 bits, parity even, 2 stops) match to 11 bits …. 9 to 12 bits value are accepted.

6.4. Ethernet 10BaseT Bridge Interface (CV20BT)

This chapter describes the operation of the Ethernet 10BT interface of the CV 20BT in AT command mode. Strike three times the enter key to configure the unit in interactive VT100 mode, and go to menu 1 then 2.

6.4.1. General

The Ethernet 10baseT interface of the CV20BT provides LAN-to-LAN connection or the connection of remote stations to the local area network in Ethernet Bridge mode.

Principle

The bridge transmits all types of Ethernet frames without exception (including the broadcast frames)

In order to absorb the Ethernet traffic peaks, the interface has a 256 frame buffer which are transmitted at the rate provided by the connection of the CV 2000.

The Ethernet filtering consists in only transmitting frames which destination MAC address is not known on the local Ethernet network. In other words the unit does not transmit the frames with a local destination address. This function optimises the traffic between the equipment and increases the throughput seen by the local network.

For filtering purposes, the interface memorises the local station addresses in a 10.000 address memory. The address of stations that do not transmit nor receive any frame during a 5 minute delay, is automatically suppressed from the memory (address aging principle)

A built-in Ethernet compression algorithm does not transmit the padding bits of the short frames and reconstructs them on the receive site. This function optimises the traffic between the equipment and increases the throughput seen by the local network.

The DTE LED on the front panel reflects the link integrity of the 10BT access.

Wiring

To facilitate the network wiring, the RJ 45 plug on the CV 20BT bridge is wired as a station mode and connects to the network as any other station. The proper wire polarity must be checked when wiring the bridge.

6.4.2. Parameters

```
                              CXR - CV 20BT E
                            Configuration menu
                           Configuration "usr0*"
                     DTE=13TS, RC=TS31, CRC=OFF, CLK=NWK

    NETWORK INTERFACE (E1)                  DTE INTERFACE (10BT)
    1) Mode Nx64       : 896 Kbps            6) Ether. Filter : ON
    2) Clock source    : Network             7) Padding compr.: ON
    3) CRC Activation  : OFF
    4) Bit E           : OFF
    5) Sensitivity     : Short Haul


                                            LOOP & TEST
                                             8)  RDL          : ACCEPTED


 ------------------------------------------------------------------------------
             Type your choice: 1 .. 8, P(revious) and press RETURN
 ------------------------------------------------------------------------------
```

Ether. Filter: this parameter enables or disables the frame filtering of the Ethernet local addresses:

- OFF no filtering, all frames are transmitted
- ON filtering, only the frames of unknown destination address are transmitted. (Default value)

Compression: this parameter enables or disables the discarding of Ethernet padding bits for the transmission between the CV 20BT. Padding bits are regenerated at the other side

- OFF: compression disabled, the frames are integrally transmitted
- ON: compression enabled, the padding bits are discarded before transmission and regenerated at the receive end (default value).

6.5. 4 ISDN S Interface (CV24BR)

6.5.1. General

The 4BR interface allows the transport of 4 ISDN basic rate accesses between a PBX and Terminal Adapter s or ISDN phones.

Principle:

When level 1 is up, the CV24BR provide a transparent path for the ISDN data. Usually, at the PBX side the CV24BR must be in Terminal mode, and on the other side the CV24BR must be in Network mode.

6.5.2. Parameters

```
                              CXR - CV 24BR E
                             Configuration menu
                             Configuration "o*"
                    DTE=12TS, RC=TS31, CRC=OFF, CLK=DTE1

    NETWORK INTERFACE (E1)                  DTE INTERFACE (BRI)
    1) Mode Nx64       : 832 Kbps           6)   Bri Mode : Terminal
    2) Clock source    : DTE1
    3) CRC Activation  : OFF
    4) Bit E           : OFF
    5) Sensitivity     : Short Haul


                                            LOOP & TEST
                                             7)  RDL          : REFUSED


-------------------------------------------------------------------------------
            Type your choice: 1 .. 7, P(revious) and press RETURN
-------------------------------------------------------------------------------
```

- Mode BRI : this parameter activates interfaces in Terminal mode (TE, LT-T) or Network mode (NT, LT-S) :
  - Terminal : connected to the PBX.
  - Network : connected to the adapters or ISDN phones. (default value).

- Clock source :
  - If the PBX is connected to the Public Telephone network : the CV24BR connected to the PBX must be set for DTE clock mode, and the remote one is set for NETWORK clock mode.
  - If the CV-24BR connect to a public E1 – G704 network : both CV24BR should be set for NETWORK clock mode, i.e. the PBX should be private and extract its clock from the CV-24BR.
- Mode N*64: Time Slot must be framed for the 4 BRI interface,, and Time Slots are set manually for each channel of the four DTE.

6.5.3. CV24BR Rear Panel

7. Diagnostics and tests

7.1. Diagnostics

The CV 2000 displays its operating parameters and connection statistics for evaluation of the transmission quality. This information is given on menu 2 in VT100 mode as shown in the following example

```
                    CXR - CV 2036 E : Status & Statistics
          Configuration "usr0*" : DTE=16TS, RC=TS31, CRC=OFF, CLK=INT
+--------------------------+-------------------------+-----------------------+
| E1 network: Carrier=UP   | Uptime     0 d 01:11:36 |  DTE V36 :  DTR=DOWN  |
+--------------------------+-------------------------++-----+-----------------------+
| RECEIVE                           TRANSMIT    ||  RTS=DOWN                    |
|  Sync FAS=UP                       Clock=UP   ||  CTS=UP   (=E1)              |
|  MF CRC=UP                                    ||  DSR=UP   (forced)          |
|  Remote Alarm=NONE                            ||  CD =UP   (=E1)             |
+-----------------------------------------------++----------------------------+
| NUMBER OF ERRORS    Last 24hrs  Prev. hour Cur. hour  Prev 15mn  Cur. 15mn |
| Codage                     561         561          0          0          0 |
| CRC                          0           0          0          0          0 |
| E bit                        0           0          0          0          0 |
| FAS                          3           3          0          0          0 |
| STATUS DOWN                                                                |
| Carrier E1           00:00:00       00:00      00:00      00:00      00:00 |
| Synchro E1           00:00:01       00:01      00:00      00:00      00:00 |
| DTE DTR              01:00:00       60:00      11:36      15:00      11:36 |
+----------------------------------------------------------------------------+
1) Change errors display mode      2) Change display of status statistics
3) Reset errors led                4) Reset statistics  5) Alarms 6) Next DTE
            Type your choice: 1 .. 5, P(revious) and press RETURN:
```

This menu shows the status of the E1/T1 connection (carrier detection, G704 synchronisation, CRC, …) and of the DTE interface (input signals).

The menu display 5 different areas for the following information :

- On top of screen, the name of the current configuration, the timeslot assignment and the clock source
- The total uptime of the unit and the network and terminal link status,
- The 24 hour error statistics window that provides the number of error of the network link, displayed either in number of errors or in duration of errored time : the bottom selection 1 option switches NUMBER and TIME statistics display.
- The 24 hour link status window that provides the last 24 hours time of up or down status of the network and terminal interfaces : the bottom selection 2 option switches UP and DOWN status display.
- The menu option entry : 1&2 for display mode and 3&4 for reset actions.
- With the BRI card we change the DTE status time with touch 6.

7.1.1. Timeslot assignment and clock

The second line displays the main configuration parameters that apply on the current connection: the configuration name, the timeslot assignment, CRC management and clock source.

7.1.2. Network Interface Status

The left part of this section provides the network interface statuses :

7.1.2.1. E1 G703-G704 interface

- Carrier : up if an HDB3 carrier is detected
- Receiver :
  - Sync FAS : UP if the G704 multi frame link is synchronised, DOWN if the CV 2000 is not synchronised
  - MF CRC: UP if at least 90% of the received CRC are correct, DOW if this rate is worst
  - Remote Alarm : shows if the receiver has detected three successive alarm A bit on the receive frames. The remote unit sets this bit in case of loss of G703 synchronisation.
- Transmitter :
  - Clock : report if the network transmit clock is well locked, DOWN otherwise. A DOWN state may happen in external / DTE clock configuration if the terminal does not provide a clock.

7.1.2.2. T1/FT1 interface

- Carrier: UP if a signal from remote is detected
- Receiver:
  - Sync : DOWN when the device is not synchronised to the receive T1 stream**.**
  - FDL: ABORTING if Facility Data Link receive all one else OK
  - Code: display code detected AMI or B8ZS.
  - Frame: display the kind of frame detected: D4 or ESF or SLC96
  - Remote Alarm : BLUE if AIS detected, YELLOW if RAI (Remote Alarm Indication) is detected, RED if a loss of signal is detected.
- Transmitter:
  - Clock : report if the network transmit clock is well locked, DOWN otherwise.

7.1.3. DTE Interface Status

The right part of this section provides the terminal interface status, i.e. the input and output signal states

7.1.3.1. X21 interface

- C: reports the state of the Command input signal
- I: reports the state of the Indication output signal

7.1.3.2. V35,V36 or V28 interface

- DTR: reports the state of the DTR-108 input signal
- RTS: reports the state of the RTS-105 input signal
- DSR: reports the state of the DSR-107 output signal
- CD: reports the state of the CD-109 output signal
- CTS: reports the state of the CTS-106 output signal

7.1.3.3. 10BT interface

- LINK: reports the state of the Ethernet link integrity
- COL: shows that collision have been detected on the Ethernet link

7.1.3.4. 4BRI interface

- DTE1 to 4: reports the state of the BRI link integrity: activated or synchronized, deactivated, not initialised.

7.1.4. Error Statistics

The CV 2000 shows an error statistics picture displayed either in number of error in duration of error through the option '1: Change error display mode'

Figures are provided for the last 24 hours, the previous hour and 15 minutes, and the current hour and 15 minutes, which show how the errors are distributed over time.

There are counters for E1/T1 coding violation, CRC errors, E bit active, and loss of Frame Alignment Signal (FAS).

The E bit is set by the remote

7.1.5. Status Statistics

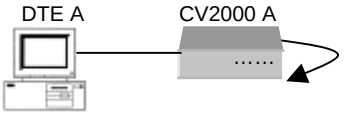
The CV 2000 shows as well a status picture of the network and terminal interfaces displayed either for the up state or for the down state through the option '2: Change display of status statistics'

There are time counters for E1/T1 carrier status, G704 frame status, and terminal status based on the X21 C signal, the V35 RTS signal, the V36 or V28 DTR signal or the 10BT link integrity signal.

7.2. Test

7.2.1. Local Analogue Loop

The CV 2000 synchronises to the carrier that it transmits on its line interface. This configuration provides a test of all the internal parts in the unit. This loop corresponds to an ITU-T V54 B3 loop.



Procedure :

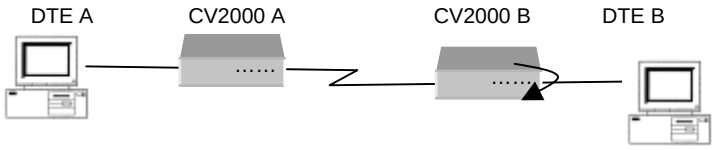
This loop is activated

- In the third menu of the VT100 interface,
- By the AT&T1 command

The loop is acknowledged by the TEST Led on the front panel.

7.2.2. Remote Digital Loop

The remote CV 2000 (B) sends back data received from the line which lets the terminal equipment (DTE A) test the data link up to the remote terminal point (DTE B). This loop corresponds to an ITU-T V54-B2 loop.



Procedure :

From location A, if the answer it RDL request is enabled on the CV2000 of side B

- In the menu 3 of the VT100 interface,
- By the AT &T2 command

From location B

- By the AT&T3 command.

8. Technical Characteristics

8.1. Transmission Modes

- E1 version
  - G703 Rate : 2048 KBPS +/- 50ppm
  - G704 frame: Nx64 (1 to 31 TS) from 64 KBPS to 1984 KBPS.
  - Coding : HDB3
  - CRC4
  - Receiver sensitivity : -40 dB
  - Transparent mode : 2048 KBPS
  - Connector RJ45/120 Ohms or BNC 75 Ohms
- T1 version
  - T1 Rate : 1544 KBPS +/- 50ppm
  - D4/ESF frame: Nx64 or Nx56 (1 to 24 TS/DS0s) from 56 or 64 KBPS to 1536 KBPS
  - Coding : B8ZS or AMI
  - CRC6
  - Receiver sensitivity : -36 dB
  - Transparent mode : 1544 KBPS
  - Connector RJ45/100 Ohms
- Ethernet bridge interface :
  - Rates : 64 to 2048 KBPS (E1) or 56 to 1536 KBPS (T1/FT1)
  - Ethernet 802.3 – 10 Base T
  - Frame buffer memory: 256
  - MAC address memory: 10.000
  - MAC address filtering: filtering or transparent bridge
  - Ethernet compression: padding bits suppression/regeneration:
- V11/X21 Interface:
  - Rates : 16 and 64 to 2048 KBPS (E1) or 56 to 1536 KBPS (T1/FT1)
  - Signal I : forced or active when connected
  - Clock :Network, terminal or internal, normal or reverse edge.
- V35 and V36/RS530 Interfaces:
  - Rates : 64 to 2048 KBPS (E1) or 56 to 1536 KBPS (T1/FT1)
  - signal DSR, CD, CTS : forced or active when connected
  - Clock :Network, terminal or internal, normal or reverse edge.
- V24/V28/RS232 Synchronous Interface:
  - Rates : 64 KBPS or 128 KBPS (E1) and 56 KBPS or 112 KBPS (T1/FT1)
  - signal DSR, CD, CTS : forced or active when connected
  - Clock :Network, terminal or internal, normal or reverse edge.
- V24/V28/RS232 Asynchronous Interface:
  - Rates : 300,600,1200,2400,4800,9600,19200,38400 BPS
  - Character format: 9bits (7,n,1), 10 bits (8,n,1/7,e,1..) , 11 bits and 12 bits.
  - signal DSR, CD, CTS : forced or active when connected
  - signal DSR, CTS : can follow remote DTR and RTS.
- 4BRI Interface:
  - 4 interfaces Rates : 192kBPS
  - channel B1, B2, D allocated to any Time Slot
  - 4 D channels in 4 dedicated Time Slots or in 1 single Time Slot.
  - Terminal or Network Mode
  - Clock : Network or Terminal 1,2,3,4 mode.

8.2. General Characteristics

Dimensions : L x W x H : 260 x 170 x 35 mm (Desktop).

Weigh : rack card CV2000PRx : 0,4 kg
Desktop with internal power supply: 0,7 kg
Desktop with external power supply : 0,6 kg + power supply: 0,45 kg

Maximum power consumption:

- 5 Vdc : 500mA
- Desktop with external power supply PVx :20 mA / 230Vac and 40 mA / 110Vac
- Desktop with internal power supply PIx : 20 mA / 230Vac and 40 mA / 110Vac
- Desktop with internal 48 Vdc converter - PCx : 100mA. / 48 Vdc

Operating temperature: 0°C up to 50°C.
Storage temperature: 0°C up to 70°C.
Hygrometry : 90% non-condensing

9. Troubleshooting

This chapter describes the operation phases of the CV 2000 and provides a diagnostic for most of the problems encountered during installation and operation.

Trouble	**Check**
Power-up phases do not progress	➢ The mains power plug, ➢ ON/OFF switch is on "ON" position ➢ Power is applied to the chassis, electrical continuity on the fuse receptacle ➢ ON or flashing of the LED ☸ on the front display
The CV 2000 does not answer the commands	➢ LED ☸ stays ON permanently. This LED flashes as soon as the unit detects the terminal on the control port (DTR signal) ➢ The CTRL plug at the terminal or PC used for the CV 2000 configuration. ➢ The terminal parameters:19,200bps, 8 data bits, 1 stop bit, no parity ➢ At power up and when a terminal is connected to the CTRL port (signal DTR), the CV 2000 sends a welcome message
The 10BT Link integrity is down	➢ Verify the cable between the CV2000 and the HUB : comply to pair polarity
Can't connect the remote	➢ Verify that the remote unit is a CXR CV2000/MX2000 ➢ Verify that the channel selected (TS n) or (TS0 / SA4 for E1) is available ➢ A framed mode must be used
Can't establish a remote loop back	➢ Verify that the remote control channel is available ➢ Verify that the RDL parameter is set to ACCEPTED on the remote unit
Chassis ground and signal ground are connected	➢ If your application need isolated grounds open the jumper J1

If the trouble remains after the above verification, please contact your distributor or call CXR Hot Line

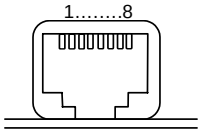
E-mail at: **support@cxr.fr**

Telephone: **+33 (0) 237 628 804**

10. Appendix

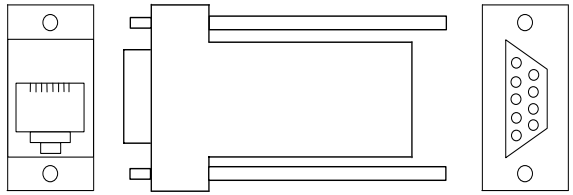
10.1. Appendix A – Wiring

10.1.1. Serial Control Port - RJ45



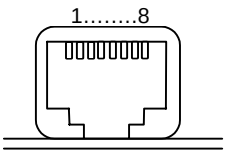
RJ45-8	Signal	I/O	Description	DB9-F
1	107 - DSR	OUT	DTE ready - permanent	6
2	109 - CD	OUT	Not used	1
3	108 - DTR	IN	Data terminal ready	4
4	102 - GND	-	Ground	5
5	104 - RXD	OUT	Received data by the terminal	2
6	103 - TXD	IN	Transmitted data by the terminal	3
7	106 - CTS	OUT	DCE ready to transmit	8
8	105 - RTS	IN	Terminal ready to transmit	7

An adapter cable (P/N 7055031517) is provided to connect to the DB9 socket of most PC COM port



10.1.2. RJ45 - Line connector

An RJ45 connector connects to the E1/T1 network. It is wired as described by the following picture :

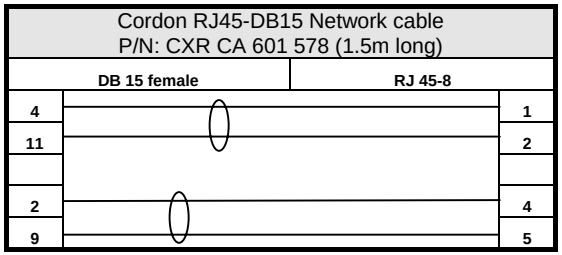


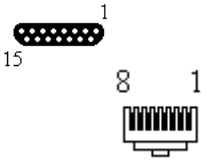
1	RECV TIP	I	Receive
2	RECV RING	I	Receive
3	NC		
4	XMIT RING	O	Transmit
5	XMIT TIP	O	Transmit
6	NC		
7	NC		
8	NC		

Pin	Signal	I/O	Description

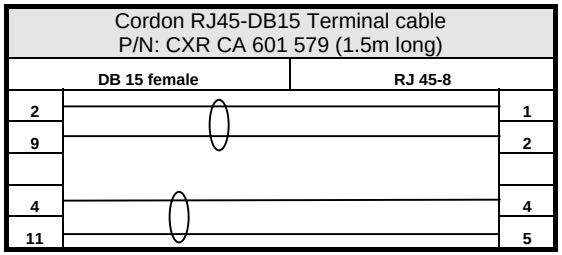
G703 cables are available on demand as an option to the CV 2000 :

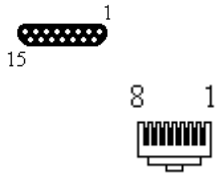
Cordon RJ45-DB15 Network cable
P/N: CXR CA 601 578 (1.5m long)



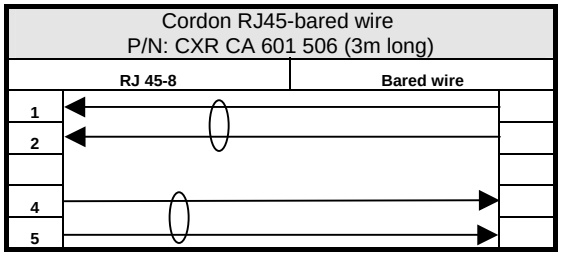


Cordon RJ45-DB15 Terminal cable
P/N: CXR CA 601 579 (1.5m long)





Cordon RJ45-bared wire
P/N: CXR CA 601 506 (3m long)



10.1.3. BNC - Line connectors

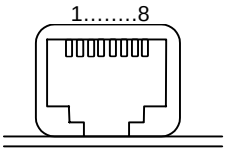
- As an option the CV2000 may be equipped with BNC line connectors (E1 version only). To comply with 75 Ohms impedance J8 and J9 jumpers must be installed.

Pin	Signal	I/O	Description
Left shield	RECV TIP	I	Receive
Left centre	RECV RING	I	Receive
Right shield	XMIT TIP	O	Transmit
Right centre	XMIT RING	O	Transmit

- The CV2000 may be equipped with an RJ45 connector and a small cable with one RJ45 and two BNC line connectors. Reference cable is CA 601 982. The transmitter is located by XMIT.

10.1.4. 10 Base T Interface connector

An RJ45 female socket provides a connection for the terminal equipment. The connector is shown on the following drawing and the RJ45 socket of the 10BT bridge is wired as per the following table:



CAUTION: The bridge is polarity sensitive and the received pair must be wired with special care.

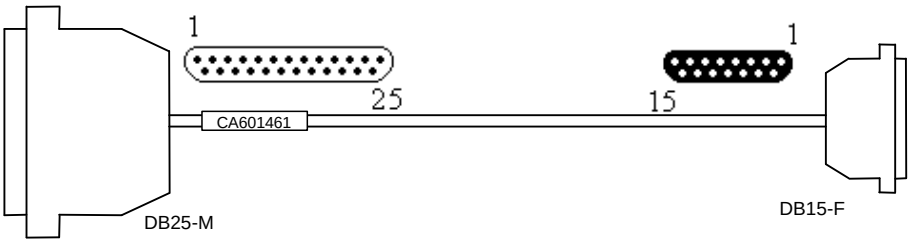
Pin	Signal	I/O	Description
1	Transmit +	Out+	**+** Transmit
2	Transmit -	Out-	-Transmit
3	Receive +	In+	+ receive
4			Not connected
5			Not connected
6	Receive -	In-	- receive
7			Not connected
8			Not connected

10.1.5. X21/V11 interfaces - DB25 connector & DB25-DB15 cable

A DB25 female connector is used to connect the terminal equipment to the CV2011 via an adaptation cable. The connector is wired as per the following table:

DB25M Pin	V11-X21 signal	DB15F Pin
1	Chassis GND	1
2	TA (Transmit)	2
3	RA (Receive)	4
4	CA (Control)	3
5		
6		
7	GND	8
8	IA (Indication)	5
9	SB (Clock)	13
10	IB (Indication)	12
11	XB (DTE Clock)	14
12		
13		
14	TB (Transmit)	9
15		
16	RB (Receive)	11
17	SA (Clock)	6
18		
19	CB (Control)	10
20		
21		
22		
23		
24	XA (DTE Clock)	7
25		

The D25M -DB15F cable is supplied with the CV2011 (Part Number: CA 601 461)

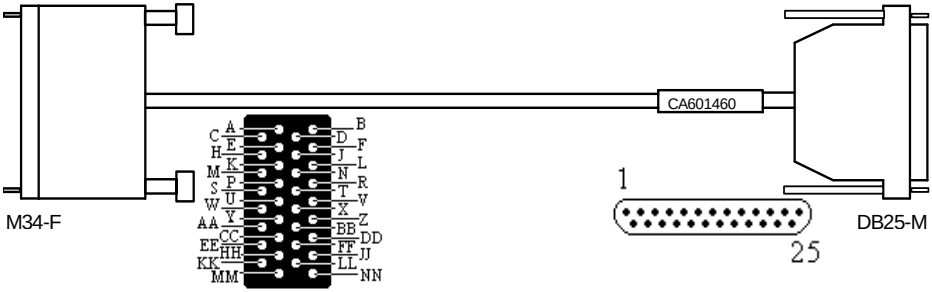


10.1.6. V35 Interface - DB25 Connector and DB25-M34 cable

A DB25 female connector is used to connect the terminal equipment to the CV2035 via an adaptation cable. The connector is wired as per the following table:

DB25M pin	V35 signal	V35/M34F pin
1	101 – P.GND	A
2	103 A – TXD A	P
3	104 A – RXD A	R
4	105 – RTS	C
5	106 – CTS	D
6	107 – DSR	E
7	102 – S.GND	B
8	109 – CD	F
9	115 B - RCK B	X
10		
11	113 B - XCK-B	W
12	114 B – TCK B	AA
13		
14	103 B – TXD B	S
15	114 A – TCK A	Y
16	104 B – RXD B	T
17	115 A – RCK A	V
18	141 – LL	K
19		
20	108 – DTR	H
21		
22		
23		
24	113 A – XCK A	U
25	142 - TEST	

The D25M - V35/M34-F cable is supplied with the CV2035 (Part Number: CA 601460).



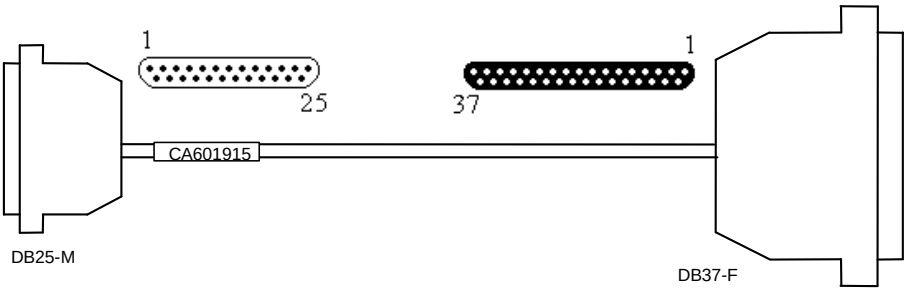
Caution: the M34 pin diameter is the international standard (1.6 mm) . The locking mechanism is done with screw.

10.1.7. V36 interface - DB25 connector & DB25-DB37 cable

A DB25 female connector is used to connect the terminal equipment to the CV2036 via an adaptation cable. The connector is wired as per the following table:

DB25M pin	RS530 signal	V36 signal	DB37F pin
1	101 – F.GND	F.GND	1
2	103 (A) – TXD (A)	Send Data (A)	4
3	104 (A) – RXD (A)	Receive Data (A)	6
4	105 (A) – RTS (A)	Request to Send (A)	7
5	106 (A) – CTS (A)	Clear to Send (A)	9
6	107 (A) – DSR (A)	Data Mode (A)	11
7	102 – S.GND	S.GND	19
8	109 (A) – CD (A)	Receiver Ready (A)	13
9	115 (B) – RCK (B)	Receive Timing (B)	26
10	109 (B) – CD (A)	Receiver Ready (A)	31
11	113 (B) – XCK (B)	Terminal Timing (B)	35
12	114 (B) – TCK (B)	Send Timing (B)	23
13	106 (B) – CTS (B)	Clear to Send (B)	27
14	103 (B) – TXD (B)	Send Data (B)	22
15	114 (A) – TCK (A)	Send Timing (A)	5
16	104 (B) – RXD (B)	Receive Data (B)	24
17	115 (A) – RCK (A)	Receive Timing (A)	8
18	141 – LL	Local Loopback	10
19	105 (B) – RTS (B)	Request to Send (B)	25
20	108 (A) – DTR (A)	Terminal Ready (A)	12
21	140 – RL	Remote Loopback	14
22	107 (B) – DSR (B)	Data Mode (B)	29
23	108 (B) – DTR (B)	Terminal Ready (B)	30
24	113 (A) – XCK (A)	Terminal Timing (A)	17
25	142 – TEST	Test Mode	18

The D25M - DB37-F cable is supplied with the CV2036 (Part Number: CA 601 915).



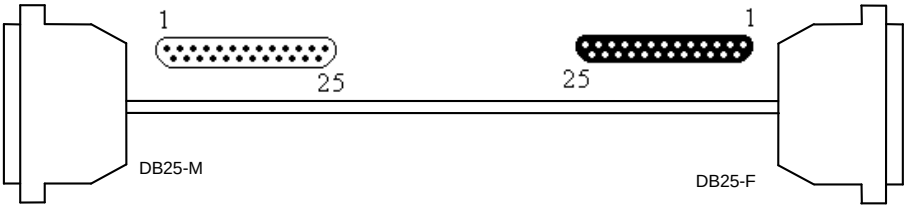
To connect a DB25/RS530 terminal use a direct connection to the DB25 -F connector. An extension cable DB25M/DB25F can be used (part number CA 999 016 as an option).

10.1.8. V28/RS232 interface - DB25 Connector & DB25-DB25 cable

A DB25 female connector is used to connect the terminal:

DB25M pin	V24 signal	DB25F pin
1	101 – F.GND	1
2	103 – TXD	2
3	104 – RXD	3
4	105 – RTS	4
5	106 – CTS	5
6	107 – DSR	6
7	102 – S.GND	7
8	109 – CD	8
9		9
10		10
11		11
12		12
13		13
14		14
15	114 – TCK	15
16		16
17	115 – RCK	17
18	141 – LL	18
19		19
20	108 – DTR	20
21	140 – RL	21
22		22
23		23
24	113 – XCK	24
25	142 – TEST	25

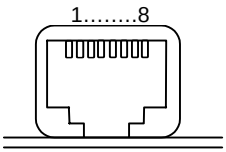
The D25-M - DB25-F cable is supplied with the CV2028 (part number CA 999016).



10.1.9. 4BRI Interface RJ45

One RJ45 female allow to connect terminal equipment.

Terminal and Network are different, see table below. In accordance with the (Network or Terminal) parameter, the DIP-SWITCH must be modified on the electronic card. See next chapter for the DIP-SWITCH parameters.



WARNING : cards are sensitive, and the parameters must be in accordance with the pin connector. The dip-switch on the card must be changed too.

Terminal Mode TE or LT-T			
Broche	**Signal**	**E/S**	**Description**
1			not connected
2			not connected
3	Send	S	Transmit line
4	Receive	E	Receive line
5	Receive	E	Receive line
6	Send	S	Transmit line
7			not connected
8			not connected

Network Mode NT or LT-S			
Broche	**Signal**	**E/S**	**Description**
1			not connected
2			not connected
3	Receive	E	Receive line
4	Send	S	Transmit line
5	Send	S	Transmit line
6	Receive	E	Receive line
7			not connected
8			not connected

10.2. Appendix B - Jumpers configuration

All the CV2000 parameters are accessible via the control port. The jumpers are used only to transform the equipment (from CV2035 to CV2036 for example**). For user security reasons, any intervention on the equipment and more particularly opening the box must only be done by competent staff and the equipment must be imperatively disconnected from the power supply.**

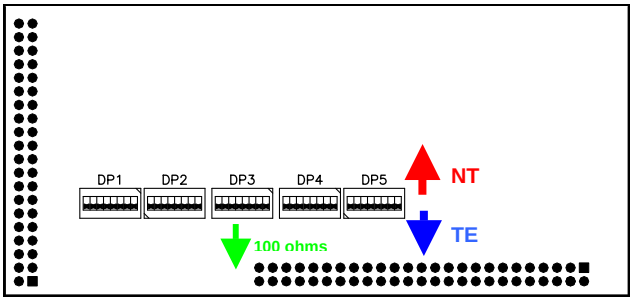
The jumpers position differs according to the hardware revision.

CV2000 Rev.00 et Rev.01	
Jumper	**Position – Meaning**
J1	➢ Installed: chassis ground connected to signal ground ➢ Removed: chassis ground isolated from signal ground
J2 - J3	➢ V11: DB25 signals assignment for CV2011 ➢ V35: DB25 signals assignment for CV2035
J4 - J7	➢ V11: V11 signal ending for CV2011

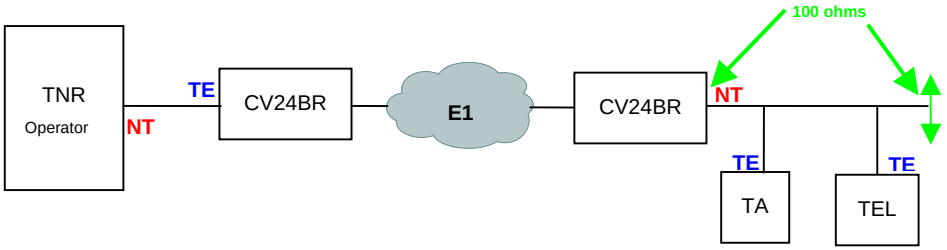
	➢ V35: V35 signal ending for CV2035
J8 - J9	➢ Installed: 75 Ohms impedance (E1/BNC interface only) ➢ Removed: 120 Ohms impedance E1 or 100 Ohms T1
J10	➢ Installed: line metallic pair continuity (T1 only)

CV2000 Rev.02 and after	
Jumper	**Position - Signification**
J1	➢ Installed: chassis ground connected to signal ground ➢ Removed: chassis ground isolated from signal ground
J2 - J4	➢ V11: TCLK,RD,RCLK V11 signal levels (CV2011, CV2035, CV2036) ➢ V28: TCLK,RD,RCLK V28 signal levels (CV2028)
J5 - J7	➢ V11: CTS,DSR,DCD V11 signal levels (CV2011, CV2036) ➢ V28: CTS,DSR,DCD V28 signal levels (CV2028, CV2035)
J8 - J9	➢ Installed: 75 Ohms impedance (E1/BNC interface only) ➢ Removed: 120 Ohms impedance E1 or 100 Ohms T1
J10	➢ Installed: line metallic pair continuity (T1 only)
J11 - J12	➢ V11: V11 signal ending for CV2011,CV2036,CV2028 ➢ V35: V35 signal ending for CV2035
J15 - J16	➢ V28: V28/RS232 function for CV2028 ➢ V11: X21/V11 function for CV2011 ➢ V36: V36/RS530 function for CV2036 ➢ V35: V35 function for CV2035

CV24BR : DIP-SWITCH on daughter card	
	Position – Signification
DP1-2 DP4-5	➢ Put near connector : Terminal mode (LT-T or TE). ➢ Put far connector : Network mode (LT-S or NT).
DP3 in the middle	➢ Put near connector : validate ended resistor 100 Ohms. ➢ Put far connector : no ended resistor..



Configuration example :



10.3. Appendix C : Warranty, General Conditions

Material and software are warranted by CXR, transportation prepaid, for a period of one year from the shipping date, under the following conditions:

1. Material and software warranty:

Comes into effect only if the warranty card duly completed has been returned to CXR within one month from the delivery date.

2. Material:

- CXR will repair its equipment during the warranty period at no cost to the customer, provided the products have not be subjected to improper installation, accident, misuse, neglect or unauthorised alterations.

3. Software:

- When applicable, CXR guarantees the supports on which the software is stored, against any manufacturing defect under normal use and against wrong handling by the user and within the limits as defined by the technical services. Included in wrong handling are erasing of one or more files, formatting of one or more diskettes.
  On the other end no guaranty applies to the use and results of applications, which integrate the software. All risks to the application results and performances are the responsibility of the user and not CXR.

4. Documentation:

- The guaranty does not cover the use and content of the documentation. CXR has no responsibility as regards the maintenance, repair or replacement of the product documentation.

5. Technical support:

- CXR provides, free of charge, a telephone technical assistance during normal office hours, during one year from the date of delivery.

6. New product versions:

- CXR reserves the right to sell at any time, improved or modified software issues of its application software. The cost of the updates will be available from CXR.
- All the above is the only warranty given by CXR for its products and excludes any other warranty of any kind expressed or implied including but not limited to the proper character of marketing or particular use.

User License and Software Guaranty

License and Propriety rights:

- The product purchase price includes the software license. Under reserve of payment of the purchase price and commitment to conform to the terms and conditions of the present document, CXR grants to the customer the non-exclusive right to use and load on a PC one copy in one location. The customer is the owner of the magnetic supports and manuals delivered. CXR maintains the propriety rights of the software saved on disks as well as all the copies and installations generated from this software.

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- The application software is protected by copyrights. Any transfer to a third party, unauthorised copying including modifications, incorporation in other software or supporting

documentation are strictly forbidden. The customer could be charged with legal proceedings for not complying with this copyrights

Usage Restrictions:

- The application software can be used on only one machine at one time. Any modification, translation, de-assembling or publication of document from these products without previous written authorisation from CXR is strictly forbidden

Cancellation:

- This license remains valid until cancellation and will be automatically voided without notice by CXR if the customer does not comply with the terms of the license. In case of cancellation, the customer will return immediately to CXR all documentation and products including copies and installations.

Warranty Card CXR SA

SENDER / USER:

Name

Company:

Address:

Material:

- ❒ **CV 2011**
- ❒ **CV 2035**
- ❒ **CV 2036**
- ❒ **CV 2028**
- ❒ **CV 20BT**
- ❒ **CV 24BR**

Serial number :

Date of purchase :
Equipment purchased from :

We would also like to know your comments on the equipment you purchased in order to improve its quality and services..

The equipment was in good condition ?	❒ Yes	❒ No
Did you find the equipment easy to operate ?	❒ Yes	❒ No
Is the manual comprehensible and complete?	❒ Yes	❒ No
Do you have all necessary accessories for the product operation ?	❒ Yes	❒ No

Remarks :

Send to : **CXR SA - Quality assurance**
Rue de l'Ornette - 28410 ABONDANT - France
Or FAX to : **+33 237 628 801**